Investment in Large Energy Production Facilities

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CEPS TF The CDM & Future Flexible Mechanisms Post-2012
19 February 2009
Issues

• Project scale

• Project timing

• Energy projects & the CDM

• Way forward?
Neubauprojekt Datteln 4 - Architekturstudie
Neubau Datteln 4 – Luftbild der Baustelle (Stand 05/2008)
Some Statistics

- 1100 MW
- 45% efficiency saving 20% CO₂
- 360 t/hr coal
- 3,000 t/hr steam
- 30 t/s cooling water
- 560,000 t soil to be moved
- 25 km of tunnels for cables
- 185 m high cooling tower
- Boiler as large as a 25 storey hotel
## Planning project power plant 50plus

<table>
<thead>
<tr>
<th>Year</th>
<th>Site decision</th>
<th>Determining plant size</th>
<th>Tender documentation</th>
<th>Tender for supplier</th>
<th>Negotiations and decision</th>
<th>Contracts, additional material</th>
<th>Approval process</th>
<th>Construction</th>
<th>Commercial start</th>
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<tbody>
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<td>2007</td>
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As of: 18.06.2008   EKW-VK
Possible to contain global warming below 2°C

Global GHG emissions
GtCO₂e per year

- Peak at 550 ppm, 3.0°C
- Peak at 510 ppm, 2.0°C
- Peak at 480 ppm, 1.8°C

Current pathway / Business-as-usual

Technical measures
< €60 per tCO₂e
Focus of the study

Additional measures
Behavioral changes & expensive measures

-38
32
-9
23

2005 2010 2015 2020 2025 2030

McKinsey&Company
Global cross-sectoral action required to reach full potential
Abatement potential; GtCO₂e per year; 2030

By sector:
- Power: 10.0
- Petroleum & Gas: 1.1
- Cement: 1.0
- Iron & Steel: 1.5
- Chemicals: 2.0
- Other Industry: 1.7
- Transport: 3.2
- Buildings: 3.5
- Waste: 1.5
- Forestry: 7.8
- Agriculture: 4.6
- Total: 38

By region:
- North America: 5.1
- Western Europe: 3.2
- Eastern Europe: 1.9
- OECD Pacific: 1.4
- Latin America: 4.5
- Rest of developing Asia: 5.7
- Africa: 2.8
- China: 8.4
- India: 2.7
- Middle East: 1.4
- Air & Sea Transport: 0.8
- Total: 38

McKinsey & Company
Significant CDM potential in global energy market

Renewables additions in developing countries\(^1\)

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<td></td>
<td>€m CAPEX / MW</td>
<td>Additional GW</td>
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<tr>
<td>Hydro</td>
<td>3</td>
<td>437</td>
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<tr>
<td>Biomass and waste</td>
<td>4.5</td>
<td>42</td>
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<tr>
<td>Wind</td>
<td>1.7</td>
<td>91</td>
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<tr>
<td>Geothermal</td>
<td>3.5</td>
<td>7</td>
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<tr>
<td>Solar</td>
<td>3.5</td>
<td>20</td>
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<tr>
<td>Tide and wave</td>
<td>4.2</td>
<td>0</td>
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<tr>
<td><strong>Total CAPEX potential (bn €)</strong></td>
<td><strong>1.749</strong></td>
<td><strong>2.176</strong></td>
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</table>

- Additions vary from 300-375 GW until 2020
- Investments in renewable market up to 2020 worth between 800-1,000 bn€\(^1\)

Worldwide energy efficiency -1.7 GT CO2 until 2020

CO\(_2\) Emissions - 450 ppm Stabilisation Case

Worldwide investments in energy efficiency market up to 2020 worth ~270 bn€\(^1,2\) of with a large part is to be from CDM countries

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1. Assumption: 2020 represents around half point on the way to 2030 scenario
2. Based on ~10k CER / MW saved and ~1.5m€/MW installed
To face the challenge of 30 Gt of abatement would lead to a marginal abatement cost of at least $55/ton (~ €40 – 50/ton)

* Assuming opportunities are addressed in order of increasing cost

Source: Stern stabilization paths, McKinsey analysis
**Post 2012**
Global emission reduction opportunities

**Risk adjusted CER/ERUs to be issued (Billion Ton)**

### By country

<table>
<thead>
<tr>
<th>Country</th>
<th>Total CERs to be issued (2008-2012)</th>
<th>Total CERs to be issued (2013-2020)</th>
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<tbody>
<tr>
<td>China</td>
<td>2.02</td>
<td>3.08</td>
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<td>India</td>
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<td>Russia</td>
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<td>JI other</td>
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<td>L&amp;C America</td>
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<td>Other</td>
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### By technology

<table>
<thead>
<tr>
<th>Technology</th>
<th>Total CERs to be issued (2008-2012)</th>
<th>Total CERs to be issued (2013-2020)</th>
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<tbody>
<tr>
<td>Energy Efficiency</td>
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<td>Landfill gas</td>
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<td>Renewables</td>
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<td>N2O</td>
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<td>HFC</td>
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- Russia's predominant role in providing ERUs for post-2012
- Great potential for generation of energy efficiency projects
- Estimated a generation in post-2012 of nearly 400 Mton per year vs. reduction demand in Europe between 500 and 700 Mton per year (according to international existing agreements)

Source: New Carbon Finance
Rejected CDM Projects by Technology
What is the issue?

• Financial additionality

• Environmental additionality
What is needed post-2012

• CDM will not deliver the large low-carbon energy projects needed
  – CCS, nuclear, hydro, renewables

• Need for new drivers or incentives
  – carbon caps
  – credits against benchmarks or baselines